
ANAEROBIC FAT FILTERS IN REGENERATIVE MEDICINE

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Introduction: Adipose tissue is widely used in plastic, aesthetic and regenerative surgery. Autologous fat grafting is one of the most popular procedures in modern surgery. Adipose tissue is usually harvested by lipectomy and consists of two fractions: fat cells, which are used in volumization, and stromal vascular fraction, which is the main source of stem cells. Then it should be specially processed through anaerobic fat transfers to obtain the maximum number of viable adipocytes of stem cells.

Methods: The number of non-destroyed adipocytes and fibroblast-like cells was obtained by hematoxylin and eosin dyeing in fat smears in every passage through each anaerobic fat transfer.

Results: With each passage through a 1.4 mm fat filter, the number of non-destroyed adipocytes and fibroblast-like cells decreased. When using a 1.2mm filter, 30 passages did not significantly reduce the number of non-destroyed cells. Each passage through a nanofilter with a mesh diameter of 0.5 mm reduced the number of non-destroyed fibroblast-like cells. The number of non-destroyed cells decreased significantly during the transition from filter to filter. When the fat filter was changed, and the cell diameter was reduced, adipocytes were destroyed to a significantly greater extent, and fibroblast-like cells did not suffer. The use of 1-3 passages through a nanofilter kept viable up to 20% fibroblast-like cells, while the use of a nanofilter with a smallest diameter of 0.15 mm allowed fat cells to be completely destroyed already after 3 passages.

Conclusion: The choice of fat filter type should be based on the desired result. To obtain the viable adipocytes while maintaining fibroblast-like cells, it is advisable to use a fat filter with a maximum diameter. It is advisable to use a 1.2mm filter to maintain the same number of fibroblast-like cells, but less number of adipocytes. The use of nanofilters is necessary in those cases when it is necessary to disconnect adipocytes as much as possible, or destroy them, preserving only stromal stem cells.